SHORT REPORT

Hybrid Repair of a Thoraco-abdominal Aortic Aneurysm through an Anterograde Approach after Transposition of Supra-aortic and Visceral Arteries

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Introduction: Retrograde access through femoral artery is usual for endovascular repair of the aorta. Some patients are not suitable to receive endovascular treatment because of poor anatomic access.
Report: We report the hybrid treatment of a type 1 thoraco-abdominal aortic aneurysm, through an anterograde access by a temporary ascending aortic conduit after the transposition of supra-aortic and visceral arteries.
Discussion: This approach was described in two precedent cases that reported good results. It seems to be an interesting alternative in the case of retrograde access failure.

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INTRODUCTION

Hybrid techniques appear to be effective for repairing thoraco-abdominal aortic aneurysm (TAAA). Usually the endovascular device is deployed through a femoral or an iliac arterial access. Transposition of supra-aortic or visceral arteries is required in order to extend the landing zone before aortic endograft exclusion. In this case, we report the endovascular treatment of a type 1 TAAA using a two-stage hybrid procedure and an anterograde access by a temporary ascending aortic conduit.

REPORT

A 79-year-old man affected by severe chronic obstructive pulmonary disease was admitted at Rouen University Hospital for a type 1 TAAA. A computed tomography (CT) scan showed a first dilatation affecting the aortic arch. It was beginning at the level of the ostium of the left carotid. The left subclavian artery was included in the aneurysm. The maximal diameter of the distal aortic arch was 60 mm. The aneurysm extended up to the tracheal bifurcation. At the lower part, the mid-descending aorta was tortuous and the diameter was 32 mm for a length of 40 mm. The second dilatation was located at the lower part of the descending aorta. The aortic diameter was 50 mm at the level of the diaphragmatic muscle. The aneurysm extended below the visceral arteries. The inter-renal aorta was measured at 33 mm (Figs. 1 and 2).

To start with, the upper aortic dilatation was treated: a transposition of cervical supra-aortic arteries was performed (right to left carotid bypass and left subclavian to carotid reimplantation) and thoracic endovascular aortic repair (TEVAR) was performed 15 days later through a femoral access. Postoperative CT scan showed the absence of endoleak and patency of supra-aortic bypass. One year later, the diameter of the distal lower aortic dilatation was measured at 65 mm. The transposition of visceral arteries was performed. The superior mesenteric artery was debranched through an iliac bypass, while the coeliac artery was ligated. Few weeks later the TEVAR procedure failed through femoral retrograde access because of a marked aortic angulation in the middle part of the descending aorta developed exactly distally to the bottom of the first endograft. Therefore, an anterograde procedure through the ascending aorta was attempted after a sternotomy. A 10-mm Dacron graft was laterally sutured to the ascending aorta. It was used as a direct conduit to push the stent graft into the thoracic descending aorta. The total length of aortic exclusion was 200 mm. The overlap with the first proximal endograft was three stents and the inflow site was above the renal arteries. After removal of the delivery system, the ascending aortic conduit was ligated. The postoperative recovery was free of any event. The patient was discharged from the hospital on day 8.

DISCUSSION

The retrograde access through femoral artery is usual for endovascular repair of the aorta. Nevertheless up to 30% of patients are unsuitable to receive endovascular treatment because of poor anatomic access. Few authors described supra-aortic vessel access with the risk of stroke or brachial injury.[1,2] In our case the second dilatation expansion led us to use a hybrid treatment again. Given the impossibility of advancing an endograft by femoral artery despite the help of humeral access, we decided to use an aortic access. Some cases were described for TEVAR during proximal

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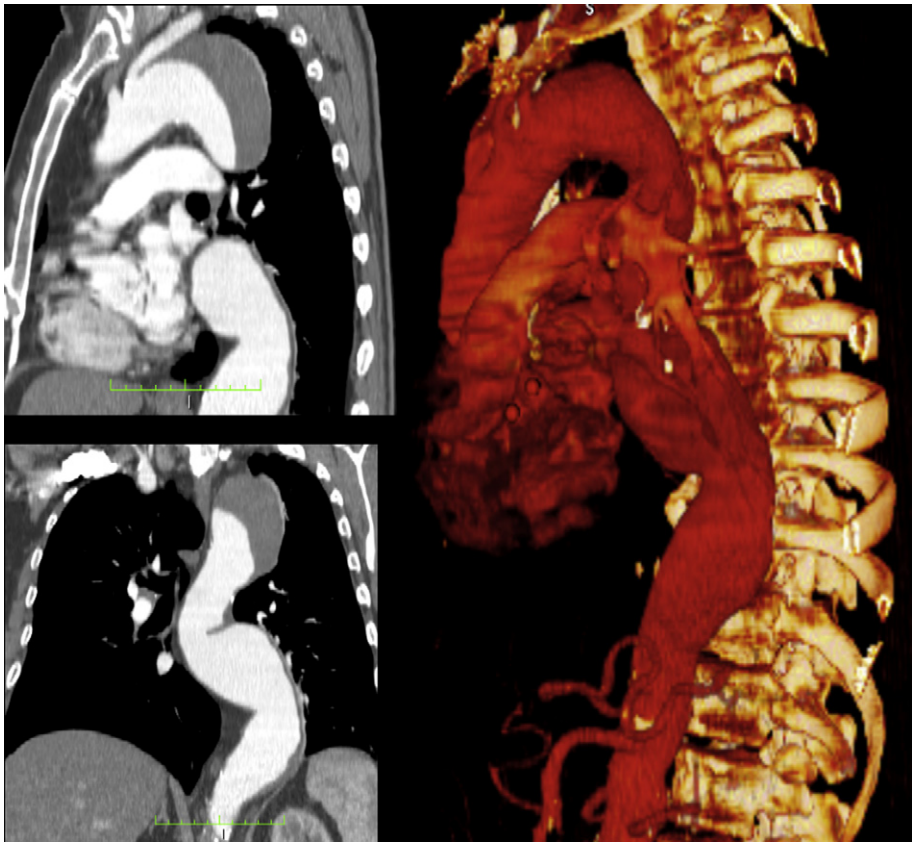

Figure 1. Anatomy of the TAA before the repair.

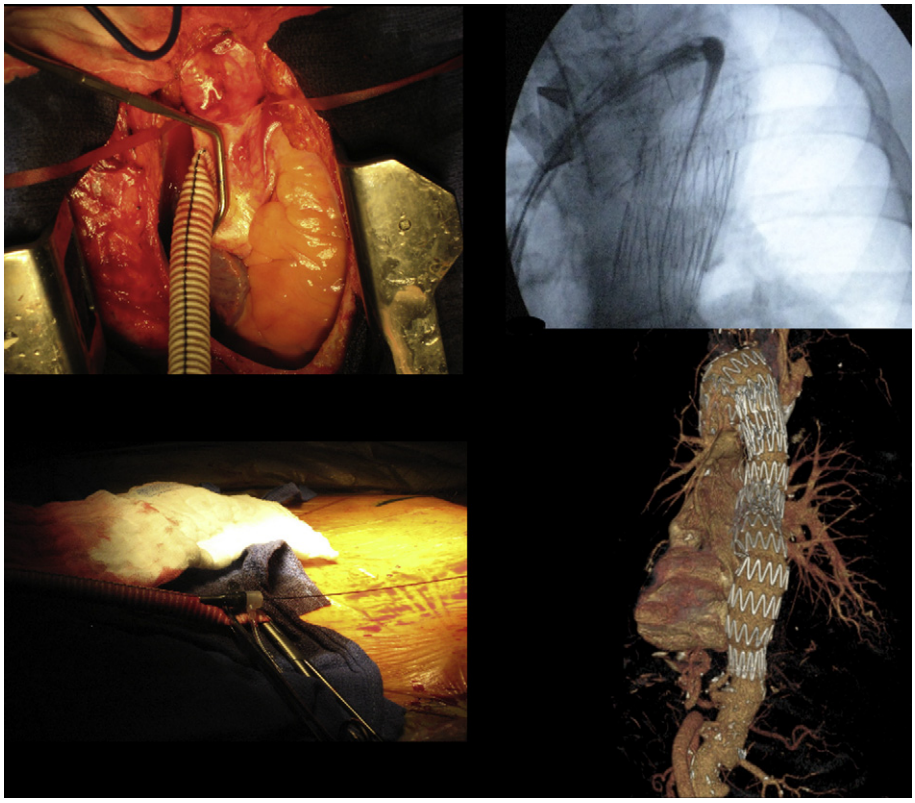

Figure 2. Peroperative view and postoperative CT scan reconstruction.

cardiac surgery using extracorporeal bypass.[3] The antegrade technique without extracorporeal circulation was previously reported by Minale,[4] and Buthia[5] who used a modified endograft. In our case a standard stent graft was used. The aortic ascendant access was not easy. The aortic arch was anguled and the endograft progression was difficult. The peculiarity of this clinical case was the double arterial transposition (visceral and cervical) and the use of the ascending aorta for access conduit to treat a TAAA.

CONFLICT OF INTEREST/FUNDING

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